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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/047,485	10/26/2001	Ronald E. Pelrine	60501-301103	4033
22434	7590	04/19/2005	EXAMINER	
BEYER WEAVER & THOMAS LLP P.O. BOX 70250 OAKLAND, CA 94612-0250			LE, HUYEN D	
			ART UNIT	PAPER NUMBER
			2643	

DATE MAILED: 04/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/047,485	<b>Applicant(s)</b> PELRINE ET AL.	
	<b>Examiner</b> HUYEN-D. LE	<b>Art Unit</b> 2643	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 25 January 2005 and 03 June 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) 19,20,23-26,28,29 and 32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18,21,22,27,30 and 33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 19,20,23-26,28,29,31 and 32 are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The information disclosure statement filed 11/14/03 fails to comply with 37 CFR 1.98(a)(1), which requires the following: (1) a list of all patents, publications, applications, or other information submitted for consideration by the Office; (2) U.S. patents and U.S. patent application publications listed in a section separately from citations of other documents; (3) the application number of the application in which the information disclosure statement is being submitted on each page of the list; (4) a column that provides a blank space next to each document to be considered, for the examiner's initials; and (5) a heading that clearly indicates that the list is an information disclosure statement. The information disclosure statement has been placed in the application file, but the information referred to therein has not been considered.

The Applicant is required to file the PTO Form 1449 with the list of the references as mentioned in the IDS filed 11/14/03. The attached PTO Form 1449 is missing.

### ***Election/Restrictions***

2. Newly submitted claims 19-20, 23, 24-26, 28-29, and 31-32 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons:

The original claims do not claim the sensor for measuring the property of the sonic actuator or the property of the environment (claims 19-20), the motion generated by the sonic actuator over time for canceling noise or vibration (claim 23), a force gradient as claimed in

claims 24-26, the active areas of the polymer layer that are separately controlled (claims 28-29), the plenum for maintaining a gas pressure (claims 31), and the microcontroller for controlling the electric field (claim 32) as claimed now.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 19-20, 23-26, 28-29 and 31-32 have been withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

### ***Double Patenting***

3. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321<sup>o</sup> may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

4. Claims 1 and 15-18 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-2 of U.S. Patent No. 6,343,129. Although the conflicting claims are not identical, they are not patentably distinct from each other because the limitations in claims 1-2 of the U.S. patent No. 6,343,129 cover the limitations in claims 1 and 15-18 in the present application.

Claims 1-2 of U.S. Patent No. 6,343,129 do not claim a support structure for the device. However, the examiner takes the Office Notice that providing a support structure for the transducer is very well known in the art.

Therefore, it would have been obvious to one skilled in the art to provide a support structure for better protecting the parts of the transducer.

Further, the rubber material or polymer material is capable of a strain of greater than 25% is known in the art (the commercially available silicone rubber from Dow Corning).

Therefore, it would have been obvious to one skilled in the art to provide the known rubber or polymer material from Dow Corning having a strain to be developed of greater than 25% in the two orthogonal in-plane directions for the polymer layer depending on the desired frequency characteristics.

***Claim Rejections - 35 USC § 112***

5. Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, it is not clear that the polymer layer is capable of a strain of greater than 25% with respect to what elements.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103<sup>©</sup> and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1-3, 21-22, 27 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Whitehead et al. (U.S. patent 4,885,783).

Regarding claims 1-3 and 33, as best understood with regarding 112, 2<sup>nd</sup> as mentioned above, Whitehead teaches a transducer which comprises an elastomeric dielectric polymer layer (36 and see col. 5, lines 14 and 34-35), first compliant electrode layer (32) and second compliant electrode layer (34, col. 5, line 32) as claimed.

Whitehead does not specifically teach a support structure for the device. However, the examiner takes the Office Notice that providing a support structure for the transducer is very well known in the art.

Therefore, it would have been obvious to one skilled in the art to provide a support structure for the Whitehead device for protecting the parts of the transducer.

Further, Whitehead does not specifically teach the polymer layer having a strain as claimed. However, providing the rubber material or polymer material having a strain of greater than 25% as claimed is known in the art (also note the commercially available silicone rubber from Dow Corning on page 10 of the specification).

Since Whitehead does not restrict to any specific type for the polymeric layer; it therefore would have been obvious to one skilled in the art to provide the known rubber or polymer material for the Whitehead transducer having a strain to be developed of greater than 25% in the two orthogonal in-plane directions depending on the desired frequency characteristics.

Regarding claim 21, Whitehead does not specifically teach that the polymer layer is transparent. However, providing a transparent polymer material is known in the art.

Since Whitehead does not restrict to any specific type for the polymeric layer; it therefore would have been obvious to one skilled in the art to provide any type of elastomeric material for the Whitehead transducer such as a transparent type for an alternate choice.

Regarding claim 22, Whitehead does not show the shape of the transducer as claimed. However, providing the rectangular, spherical or cylindrical shape for a transducer is known in the art.

Therefore, it would have been obvious to one skilled in the art to provide any shape for the transducer of Whitehead such as a rectangular, spherical or cylindrical shape for an alternate choice and depending on the desired frequency characteristics or the space for containing the transducer.

Regarding claim 27, Whitehead does not specifically teach the membrane thickness as claimed. However, it is obvious to one skilled in the art to provide any thickness for the membrane of the transducer of Whitehead such as a thickness of less than 100 micrometers depending on the application and the desired frequency characteristics.

8. Claims 1-6, 8-9, 13-16, 21-22, 27, 30 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Micheron (U.S. patent 4,400,634) in view of Whitehead.

Regarding claims 1-4, 22, 30 and 33, Micheron teaches a transducer which comprises an dielectric polymer layer (1, 11), first and second compliant electrode layers (the metal films 4, 5 and 9) as claimed. Micheron further shows a support structure as claimed (15, 17).

Micheron does not specifically teach that the dielectric polymer layer is an elastomeric material. However, providing the elastomeric material for the dielectric layer is known in the art.

Whitehead teaches an elastomeric material (the rubber dielectric 36) for the electret layer of an electrostatic transducer.

Therefore, it would have been obvious to one skilled in the art to provide the elastomeric



layer, as taught by Whitehead, for the dielectric layer of Micheron for an alternate choice.

Further, Micheron in view of Whitehead do not specifically teach the polymer layer having a strain as claimed. However, providing the rubber material or polymer material having a strain of greater than 25% as claimed is known in the art (also note the commercially available silicone rubber from Dow Corning on page 10 of the specification).

Since Whitehead does not restrict to any specific type for the polymeric layer; it therefore would have been obvious to one skilled in the art to provide the known rubber or polymer material for the Micheron in view of Whitehead transducer having a strain to be developed of greater than 25% in the two orthogonal in-plane directions depending on the desired frequency characteristics.

Regarding claims 5-6, Micheron shows the portions of the membrane (14) bulge in a first direction at least some of the apertures (figure 10).

Regarding claims 8-9, Micheron shows the membrane that is biased by a gaseous pressures as claimed (see the deformations of the membrane in figures 9-10).

Regarding claim 13, Micheron shows the support structure as claimed (figure 10).

Regarding claim 14, Micheron shows the multi-layer membrane with a plurality of elastomeric dielectric polymer layers and the electrode layers as claimed (figures 4-5).

Regarding claims 15-16, Micheron teaches a driver and the summer as claimed (col. 4, lines 38-40).

Regarding claim 21, Whitehead does not specifically teach that the polymer layer as claimed. However, providing a transparent polymer material for the electrostatic transducer is known in the art.

Since Whitehead does not restrict to any specific type for the polymeric layer; it therefore would have been obvious to one skilled in the art to provide any type of elastomeric material for the Micheron in view of Whitehead transducer such as a transparent type for an alternate choice.

Regarding claim 27, Micheron in view of Whitehead does not specifically teach the membrane thickness as claimed. However, it is obvious to one skilled in the art to provide any thickness for the membrane of the transducer of Micheron in view of Whitehead such as a thickness of less than 100 micrometers depending on the application and the desired frequency characteristics.

9. Claims 1-12, 14, 21-22, 27, 30 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bobbio (U.S. patent 5,206,557) in view of Whitehead.

Regarding claims 1-4, 22, 30 and 33, as best understood with regarding 112, 2<sup>nd</sup> as mentioned above, Bobbio teaches a transducer which comprises an dielectric polymer layer (21, 21' and see col. 8, line 4), first and second compliant electrode layers (the metal films 23, 23') as claimed (figure 3). Bobbio further shows a support structure as claimed (24, 25).

Bobbio does not specifically teach that the dielectric polymer layer is made of an elastomeric material as claimed. However, providing the elastomeric material for the dielectric layer is known in the art.

Whitehead teaches an elastomeric material (the rubber dielectric 36) for the electret layer of an electrostatic transducer.

Therefore, it would have been obvious to one skilled in the art to provide the elastomeric layer, as taught by Whitehead, for the dielectric layer of Bobbio for an alternate choice.

Further, Bobbio in view of Whitehead do not specifically teach the polymer layer having a strain as claimed. However, providing the rubber material or polymer material having a strain of greater than 25% as claimed is known in the art (also note the commercially available silicone rubber from Dow Corning on page 10 of the specification).

Since Whitehead does not restrict to any specific type for the polymeric layer; it therefore would have been obvious to one skilled in the art to provide the known rubber or polymer material for the Bobbio in view of Whitehead transducer having a strain to be developed of greater than 25% in the two orthogonal in-plane directions depending on the desired frequency characteristics.

Regarding claims 5-6, Bobbio shows the portions of the membrane bulge in a first direction at least some of the apertures (figure 1B).

Regarding claims 7, Bobbio shows the portions of the membrane bulge in a first direction at least some of the apertures (figure 1B) and the portions of the membrane bulge in a second direction at others of the apertures (figure 1B).

Regarding claims 8-9 and 12, Bobbio shows the membrane that is biased by a gaseous pressure as claimed (see the deformations of the film in figures 9-10).

Regarding claims 10- 11, Bobbio teaches the membrane which is biased by a polyimide connector (26).

Bobbio does not specifically teach soft foam or a closed-cell foam material as claimed. However, Bobbio does estimate a synthetic polymeric resin for a spring force to bias the membrane.

Since Bobbio teaches a connector for supporting flexible strips; it therefore would have

been obvious to one skilled in the art to provide any resilient material for the connector (26) of Bobbio such as a soft foam or a closed-cell foam for better controlling the spring force of the transducer.

As shown in the drawings, the diameter of the connector is substantially less than a diameter of the apertures.

Regarding claim 21, Whitehead does not specifically teach that the polymer layer as claimed. However, providing a transparent polymer material for the electrostatic transducer is known in the art.

Since Whitehead does not restrict to any specific type for the polymeric layer; it therefore would have been obvious to one skilled in the art to provide any type of elastomeric material for the Bobbio in view of Whitehead transducer such as a transparent type for an alternate choice.

Regarding claim 27, Bobbio in view of Whitehead does not specifically teach the membrane thickness as claimed. However, it is obvious to one skilled in the art to provide any thickness for the membrane of the transducer of Bobbio in view of Whitehead such as a thickness of less than 100 micrometers depending on the application and the desired frequency characteristics.

### ***Response to Arguments***

10. Applicant's arguments filed 6/03/04 have been fully considered but they are not persuasive.

Responding to arguments about the strain of the polymer layer, the examiner has explained in the Office Action. Further, the Applicant should note that providing a rubber

material or an elastomeric material having the range of strain of greater 25% in the transducer is known in the art (note the commercially available silicone rubber from Dow Corning).

Therefore, it would have been obvious to one skilled in the art to provide the commercially available silicone elastomer or silicone rubber for the transducer of Whitehead, Bobbio and Micheron.

Responding about the arguments of Whitehead, Micheron or Bobbio device, the Applicant should note that Whitehead, Micheron or Bobbio does not disclose that the transducer does not have strains greater than 2-4%, or large strains would make the device to be non-operable as argued on page 6 of the Remarks.

### ***Conclusion***

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to HUYEN D. LE whose telephone number is (571) 272-7502. The examiner can normally be reached on 9:30AM-6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, CURTIS KUNTZ can be reached on (571) 272-7499. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



HL  
April 15, 2005



HUYEN LE  
PRIMARY EXAMINER